

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
15 April 2004 (15.04.2004)

PCT

(10) International Publication Number
WO 2004/031397 A3

(51) International Patent Classification⁷: **G06F 17/00**,
17/10, 17/11, C12Q 1/68, 1/02, G01N 33/00, 33/15

(21) International Application Number:
PCT/US2003/025027

(22) International Filing Date: 8 August 2003 (08.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/402,340 8 August 2002 (08.08.2002) US

(71) Applicant (for all designated States except US): **EVOLUTIONARY GENOMICS, LLC** [US/US]; Bioscience Park Center, 12635 East Montview Boulevard, Suite 211, Aurora, CO 80010 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **MESSIER, Walter** [US/US]; 2418 Bowen Street, Longmont, CO 80501 (US).

(74) Agents: **SWANSON, Barry, J. et al.**; Swanson & Bratschun, L.L.C., 1745 Shea Center Drive, Suite 330, Highlands Ranch, CO 80129 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
10 September 2004

(15) Information about Correction:

Previous Correction:

see PCT Gazette No. 23/2004 of 3 June 2004, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DETECTION OF EVOLUTIONARY BOTTLENECKING BY DNA SEQUENCING AS A METHOD TO DISCOVER GENES OF VALUE

(57) Abstract: This invention relates to using molecular and evolutionary techniques to identify polynucleotide and polypeptide sequences corresponding to commercially or aesthetically relevant traits in domesticated plants and animals, specifically, a method to detect evolutionary bottleneck sequences.



WO 2004/031397 A3

100 JAN 2003 22393

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25027

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : G06F 17/00, 17/10, 17/11; C12Q 1/68, 1/02; G01N 33/00, 33/15 US CL : 702/19, 20; 435/6, 29; 800/3; 436/183 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 702/19, 20; 435/6, 29; 800/3; 436/183 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) STN, WEST, evolut?, bottlen?, messier		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P --- Y,P	LAZARO, E. et al, Modeling viral genome fitness evolution associated with serial bottleneck events: Evidence of stationary states of fitness, J. Virology, September 2002, Vol. 72, No. 17, pages 8675-8681, see entire document.	1-4 and 10 ----- 5, 7, and 11-14
X --- Y	IQBAL, M.J. et al, A genetic bottleneck in the 'evolution under domestication' of upland cotton <i>Gossypium hirsutum</i> L. examined using DNA fingerprinting, Theoretical and Applied Genetics, September 2001, Vol. 103, No. 4, pages 547-554, see entire document.	1-4 and 10 ----- 5, 7, and 11-14
X --- Y	US 6,274,319 B1 (MESSIER et al) 14 August 2001 (14.08.2001), see entire document.	1-4 and 10 ----- 5, 7, and 11-14
X --- Y	EYRE-WALKER, A. et al, Investigation of the bottleneck leading to the domestication of maize, Proceedings of the National Acaademy of Sciences, USA, April 1998, Vol. 95, pages 4441-4446, see entire document.	1-4 and 10 ----- 5, 7, and 11-14
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 28 April 2004 (28.04.2004)	Date of mailing of the international search report 29 JUN 2004	
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)872-9306	Authorized officer James Martinell <i>J. Roberts for</i> Telephone No. (571) 272-1600	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25027

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claim Nos.: 8 and [9]
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
There is no claim 9. Claim 8 depends from claim 9 and is so incomplete that no meaningful search can be accomplished for claim 8.
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.